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9-2013

# ARTZ 335.01: Clay and Glazes

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**Syl-S13-A335-01-BL CLAY AND GLAZES FALL 2013**

**ARTZ 335, 3 cr. Prereq. ARTZ 108 , ARTZ231**

**Class hours: Mondays 4-7**

**Plus kiln firing workshop: Proposed dates: load Fri., Sep 20 pm, fire Sat., Sept. 21, 9am-6pm**

**NO CLASS SEPT 2, NOV.11**

**Final Exam: either Mon Dec. 9, 5:30-7:30 or Thurs Dec. 12 1-3**

Professor Beth Lo X5893 elizabeth.lo@umontana.edu

Office hours: M, 1-2 , W 4-5 Art Annex 129

Art Dept Info <http://umartdepartment.wordpress.com/>

**Required Texts:** Cushing's Handbook by Val Cushing

Linda Arbuckle pdf downloads [http://lindaarbuckle.com/arbuckle\\_handouts.html](http://lindaarbuckle.com/arbuckle_handouts.html)

Materials pdf

Colorants and Opacifiers pdf

Bisque firing pdf

Clay and clay bodies pdf

Fluxes pdf

Reduction Firing pdf

**Course Description:** In-depth study of the physical and chemical properties of clays and glazes. Hands on testing of various clay and glaze formulas and an introduction to kiln firing.

**Course Objectives:** This class is intended to give the student technical background necessary for most basic processes in ceramic artmaking. Clay and glaze chemistry is so rich and complex that it is impossible to cover these subjects completely in one semester, but I hope to give the student the background to know how to approach most problems he or she will encounter in ceramics. The following syllabus is a general outline of the class structure and the subjects that we will be covering.

**Projects:**

Notebook

Materials testing

Glaze development (blog postings) <http://umtclayandglaze.blogspot.com/>

Cone 6 oxidation

Cone 10 Reduction

Firing gas kilns (small groups)

Clay digging

Clay body and slip development

Sagger firing, terra sigillatas

Final project

**YOU WILL BE EXPECTED TO SPEND AT LEAST 5 HOURS PER WEEK OUTSIDE OF CLASS TIME FOR HOMEWORK. DEADLINES FOR ASSIGNMENTS ARE CRITICAL! WE NEED TO FIRE TESTS AS A CLASS, AND THE ASSIGNMENTS BUILD ON EACH OTHER**

**WE WILL BE SCHEDULING A ONE DAY MANDATORY CONE 10 GAS KILN FIRING WORKSHOP. THE FIRING WILL LAST FROM APPROX 9AM-8PM. PLEASE TRY TO**

ATTEND AS MUCH OF THIS WORKSHOP AS POSSIBLE. You will also be required to join one of five firing groups for independent class test firings.

ALL CLASSES ARE RESPONSIBLE FOR CLEAN UP. EACH STUDENT WILL BE EXPECTED TO SIGN UP FOR TWO 7PM WEDNESDAY EVENING CLEAN UP SESSIONS.

**Grades:** Grading will be based on completion of each assignment on time 15%, firing group (10%), blog entry (10%), midterm report (25%), final exam (25%) final project (15%), energy, participation and clean up (15%). All attendance is mandatory. Each unexcused absence can cost you 1/2 of a grade letter.

**VISITING ARTISTS AND CLAY EXHIBITIONS:** tba

The Clay Studio of Missoula

**CLASS 1 Aug. 26 BASIC CERAMIC MATERIALS**

Lecture: Intro to basic ceramic materials and types of ceramic firings. Linda Arbuckle website

[http://lindaarbuckle.com/arbuckle\\_handouts.html](http://lindaarbuckle.com/arbuckle_handouts.html)

**ORGANIZE GLAZE AREA**

Experiment with materials, fire in stoneware bowls to cone 04 and 10. Make two stoneware pinch pots and label clearly on the bottom the name of the ingredient you are testing plus either "Cone 04" or "Cone 10". We will load all these bowls into the kiln today and slow fire them.

**Homework:** Make 60 test tiles from stoneware clay, by Friday. Make a test tile box to hang the tiles in. (See drawing.) After a day left out in the air, when they are almost but not quite dry, dip each tile half way into Cone 10 white slip. See drawing. The tiles need to be BONE DRY by next class Sept.9 !

Read handout and Cushing p. 43, 70-73

Arbuckle materials pdf

**CLASS II Sept.9 MIXING GLAZES/BISQUE FIRING**

Go over materials firing at Cone 04.

How to load and fire electric bisque kiln. Load test tiles.

How to mix and apply glaze and use the gram scale

Lecture: Basic glaze info, high fire, cone 6-10

**Homework:** Mix five "known glazes" for cone 10, dipping one tile for Oxidation and one tile for Reduction using tiles 1-10 per student. (I will fire the Reduction tiles at my studio). Find a partner and use one of your boxes for Oxidation and one for Reduction. Choose a variety of color and surface. Read Cushing p. 89-91 look at glaze recipes pp. 114-132. Arbuckle bisque firing pdf

UM bisque firing handout

**CLASS III, Sept 16 FIRING IN REDUCTION AND OXIDATION, COLORANTS**

Load Cone 10 test glazes and materials cones in electric kiln. Oxidation firing.

Color lecture

Reduction firing lecture, Geil film.

**Homework:** WORK WITH PARTNER. Choose one of your glazes to do a color run test. Dip a tile for oxidation and a tile for reduction. Use tiles 6-20 for Oxidation and

your partner's 6-20 for Reduction. Read handout and Cushing p. 47-52, 65, 67-73,(unity mol. Formulas) and p. 74-80 colorant info  
Arbuckle colorant and opacifier pdf  
Read Cushing p. 44-46 Arbuckle reduction firing pdf

**SAT SEPT 20: Kiln firing workshop 9am-9pm, your cone 10 test tiles must be ready to load. Load the materials bowls at cone 10.**

**CLASS IV Sept 23 COLORANT BLENDS** Go over firing results As soon as your tiles are out, label them with permanent marker the name of the glaze name, firing temp and atmosphere.

Example: Shaner Red C10 Re

2. colorant blends lecture
3. More on glaze materials, fluxes
4. Unity Molecular Formulas: a brief overview
5. flux, silica, clay ratios, limit formulas, molecular formulas

**Homework: Cushing 83, 84, 85 WORK WITH A PARTNER,** Do an ABCDE color test. Dip a tile for Oxidation and one for Reduction. 10 tiles per student  
Volunteer firer by Sunday night for colorant blend tests  
**FIRING GROUP 1**

**CLASS V. Sept30 CONE 6**

Guest lecturer: Cone 6 glazes

Unload kiln and go over firing results. As soon as your tiles are out, label them with permanent marker the name of the glaze. Make pots for testing glazes on!!!!

**HOMEWORK: CONE 6 GLAZES:** (no partners) Each person mix up seven cone 6 oxidation glazes based on a single color, (but possibly with more than one colorant) "PAINT CHIP, HISTORICAL, OR ACTION GLAZES"

*Blue gloss*

*Blue matt*

*Red*

*White*

*Brown, dark*

*Brown, light*

*Black*

*Grass Green*

*Yellow*

*Pink*

*Orange*

*Bronze*

*Chartreuse*

*Celadon green*

**Volunteer firer for cone 6 glazes**

**CLASS VI Oct. 7 MIDTERM ASSIGNMENT**



1. Go over firing results. As soon as your tiles are out, label them with permanent marker the name of the glaze name, Re or Ox Cone 10.

**Homework: MIDTERM** (Work with a partner for discussion, but each of you do your own midterm project). Looking at both of your glazes for resources. each person should pick two glazes, one cone 6 oxidation, one cone 10 reduction that look promising but **have problems** with melt, color, opacity etc. Pick one problem to fix and do a systematic series of tests. Discuss with your partner what tests to try and perhaps both of you try the same tests on different glazes. Mix 6 tests for each glaze trying to "fix" or "improve" glazes. (10 tiles per student). Hand in your findings using the chart provided!!

**MIDTERM IS DUE OCT. 21**

Read Cushing p. 83-85, 57-61, 51-54, 67-69

Arbuckle, fluxes pdf

**\*\*\* ORGANIZE DRIVERS FOR OCT. 14 FIELD TRIP!!!! IMPORTANT!!!!\*\*\*\***

## **FIRING GROUP 2**

### **CLASS VII Oct 14. CLAYS**

1. Go over firing results. As soon as your tiles are out, label them with permanent marker the name of the glaze name.
2. Demo: how to mix up clay from dry ingredients
3. **Clay digging field trip**

**Homework: work in pairs:** Make up 2 test clay bodies:

- one high fire porcelain-like clay body for saggar firing. Make shrinkage and absorption bars
- one clay body using the clay we dug. Make shrinkage and absorption bar and throw one 6 inch cylinder.
- Each person-- one low fire clay white body, Make 15 tiles from one this clay body. Make absorption and shrinkage bar

\*\*\*\*Bisque clay shrinkage tests and tiles.

## **FIRING GROUP 3**

Volunteer bisque firer for new test tiles.

### **CLASS VIII Oct. 21 CLAY LECTURE, MIDTERMS DUE**

1. Go over firing results. As soon as your tiles are out, label them with permanent marker the name of the glaze name, Cone 10 Re or Cone 6 Ox.
2. Clay lecture, shrinkage, absorption
3. MIDTERM PRESENTATIONS

**Homework:** Read: Arbuckle clay and clay bodies pdf

. Choose the best glazes to test again on test tiles and on pots. Use 5 more tiles.

## **FIRING GROUP 4**

### **CLASS IX Oct. 28, SLIPS LECTURE**

Look at redo tests and glazes on pots

slips lecture for green to bisque, colors

**Homework:** Read Cushing 25-33m 8A-12, 15, 34-42 Mix six cone ten slips: Develop a white slip, a black slip, and a colored slip for bisque and the same for greenware. Make 3 new test tiles to test greenware slips on. Apply when leather hard.

Put your bisque slip on a test tile. Cover this tile plus the fired tile with greenware slip with a clear glaze.

Work on blog entries. You need to write up at least your six best glazes, three Cone 6 oxidation, three Cone ten. Extra credit for more entries.

## **FIRING GROUP 5.**

### **CLASS X NOV. 4 PREP FOR SAGGAR, WORKDAY, DISCUSS FINAL PROJECTS**

1. Make terra sigillata

2. burnishing clay, saggar firing

Set up photography for blog, prepare blog entries

**Homework::** Build piece and saggar for saggar firing by Friday. Have it ready to bisque by SUNDAY

Continue with absorption and shrinkage tests. Get your slip tests glazed and fired.

\*\*\*\* Bisque saggar pieces. Volunteer firer. To cone 014

### **CLASS XI Nov. 18 LOW FIRE AND SAGGAR FIRING**

1. check shrinkage and absorption tests, slip tests

2. Load and Fire saggar kiln

3. Low fire glaze lecture

**Homework:** .Mix 8 low fire glaze test based on handout. Due to be fired on Sunday April 17

\*\*\*\* Fire low fire glaze tests: volunteer firer cone 05 electric kiln

**Final project proposals.** Read Cushing 31, 13-24

### **CLASS XII Nov. 25**

1. Go over firing results from saggar and low fire glaze firing

2. Specialty clays, slip casting, wood soda and salt recipes, health hazards, room temperature fixits

Blog entries due.

### **CLASS XIII: Dec. 2**

Final project presentations

Review for exam

### **CLASS XIV Finals Week:**

**Final Exam: either Mon Dec. 9, 5:30-7:30 or Thurs Dec. 12 1-3**

**Clean up**

### **TEST TILES SUMMARY**

Your tiles should be organized as follows:

HIGH FIRE

1-10 known Cone 10 Oxidation glazes

11-25 Colorant tests Cone 10 Ox

11-25 (partner) Colorant tests Cone 10 Re  
26-35 ABCDE Colorant blend Ox  
26-35 (partner) ABCDE Colorant blend RE  
36-42 Cone 6 OX tests  
43-55 Midterm tests  
56-60 Redo midterm tests  
LOW FIRE  
Shrinkage, absorption tests  
1-5 slip tests  
6-15 Low fire glaze tests

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Academic Misconduct and the Student Conduct Code  
All students must practice academic honesty. Academic misconduct is subject to an academic penalty by  
the course instructor and/or disciplinary sanction by the university. All students need to be familiar with the  
Student Conduct Code. The Code is available for review online at  
[www.umt.edu/SA/VP/SA/Index.cfm/page/1321](http://www.umt.edu/SA/VP/SA/Index.cfm/page/1321)*